UNITED STATES PATENT AND TRADEMARK OFFICE

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10/074,958	02/11/2002	MacGregor Belniak	005378.P001	6988

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EXAMINER
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/074,958	BELNIAK ET AL.
	Examiner	Art Unit	
	Joseph P. Hirl	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _08 June 2007_.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _11-23_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _11-23_ is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _11 February 2002_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   This Office Action is in response to an APPEAL BRIEF entered June 8, 2007 for

the patent application 10/074,958 filed on February 11, 2002.

2.   All prior office actions are fully incorporated into this Final Office Action by

reference.

Reopening of Prosecution

3.   In view of the appeal brief filed on June 8, 2007, PROSECUTION IS HEREBY

REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the

following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply

under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed

by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and

appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth

in 37 CFR 41.20 have been increased since they were previously paid, then appellant

must pay the difference between the increased fees and the amount previously paid.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Examiner's Note (EN): ¶ 9. applies. From MPEP 2111.01, Plain Meaning cites guidance

from In re American Academy of Science Tech Center, 367 F.3d 1359, 1369, 70

USPQ2d 1827, 1834 (Fed. Cir. 2004). "Although claims of the issued patents are

interpreted in light of the specification, prosecution history, prior art and other claims,

this is not the mode of claim interpretation to be applied during examination. During

examination, the claims must be interpreted as broadly as their terms reasonably allow."

Under such guidance, "dynamically processing a database to eliminate missing value in

records, maps into normalized and reconditioned images; statistical summary of

processed data maps into normalized images; a high-scoring network maps into a

trained neural network; compute a decision maps into the result of a neural network;

discretizing variable maps into pixel images; bank customer transaction (descriptive

terminology) records maps into data; at-risk (descriptive terminology) customer maps

into face verification; eXtensible Markup Language (descriptive terminology) maps into

computer implementation. Applicant is further invited to review MPEP 2131.05 related

to 35 USC § 102 rejections.

5.   Claims 11-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kung

et al. (USPN 5,850,470, referred to as **Kung**).

Claim 11

Kung anticipates dynamically processing a database to eliminate missing values

in records, each record to contain a plurality of values (**Kung**, c4:55-64; EN: lower

resolution eliminates missing values by increasing tolerance in location errors;

normalization of images is equivalent to dynamically processing a database); preparing

a statistical summary of processed data in the database (**Kung**, c4:55-64; EN: such

would be normalization since statistical merely means a numerical datum); constructing

a database structure to hold the statistical summary(**Kung**, c4:44-64); searching

through possible relationship models to find a high-scoring network(**Kung**, c2:16-29;

c4:65-67; c5:1-9; EN: the relationship model is the neural network under training; when

training is complete, such neural network is a high scoring network ... relationship

model); and using the high-scoring network to compute a decision for a new case

(**Kung**, c2:50-54).

Claim 12

Kung anticipates discretizing continuous variables in the database before

preparing the plurality of statistical summaries (**Kung**, c4:55-64; EN: such are the use of

pixels).

Claim 13

Kung anticipates modifying a relationship of the high-scoring network (**Kung**,

c5:49-60).

Claim 14

Kung anticipates the new case consists of values of a subset of fields of a record (**Kung**, c5:15-19; EN: such is a new face).

Claim 15

Kung anticipates records in the database represent bank customer transaction records, and the decision is to identify an at-risk customer of the bank (**Kung**, c4:14-22; EN: customer transaction records is a term for input data; at-risk customer is synonymous with confidence score).

Claim 16

Kung anticipates the statistical summary is a Bayesian model of correlations between data in records (**Kung**, c7:6-13; EN: such is the relationships in the network model).

Claim 17

Kung anticipates the decision is one of a detection of an illegal financial transaction, a network fault diagnosis, or a prediction of a result of a pharmaceutical compound in an organism (**Kung**, c2:50-54; EN: descriptive terminology does not change the character or functionality of the decision making).

Claim 18

Kung anticipates aggregating similar database records together (**Kung**, c4:44-64); and

computing a frequency of occurrence (**Kung**, c4:55-64; EN: such is a histogram).

Claim 19

Kung anticipates preparing a plurality of hashes to cluster the database records

(**Kung,** c4:44-64; EN: hash is a technique for arranging a set of items such as edges of

a facial region which are then related as pixels).

Claim 20

Kung anticipates the database structure is an alternating decision tree ("ADTree")

(**Kung,** c3:11-14; EN: according to the applicant's specification at ¶ 0057, an alternating

decision tree merely a database storage).

Claim 21

Kung anticipates the database structure comprises correlation statistics between

nodes (**Kung,** c2:31-49; EN: correlation statistics are represented by the weights

associated with neural network nodes).

Claim 22

Kung anticipates inferring a value of a non-observed variable based on a

previous observation and the high-scoring network (**Kung,** c5:49-60; EN: such is the

updating of the DBNN).

Claim 23

Kung anticipates storing the high-scoring network in an eXtensible Markup

Language (XML") format (**Kung,** c2:17-21; EN: computer implementation requires the

use of an implementation language and eXtensible Markup Language merely provides

such implementation ... no functional distinction).

Response to Arguments

6.   Applicant's arguments filed on June 8, 2007 related to Claims 11-23 have been

fully considered but are not persuasive.

In reference to Applicant's argument:

Independent claim 11 recites a method comprising several operations, including dynamically processing a database to eliminate missing values in records, each record to contain a plurality of values; preparing a statistical summary of processed data in the database; constructing a database structure to hold the statistical summary; searching through possible relationship models to find a high-scoring network; and using the high-scoring network to compute a decision for a new case. These operations define a "soup to nuts" process by which an embodiment of the invention can produce a decision based on information in a database.

The Examiner rejects most elements of this claim as anticipated by two sections of Heckerman: Section 6, which discusses "Methods for Incomplete Data," and Section 12, "A Simple Example." The "Methods for Incomplete Data" section does describe several techniques for addressing missing values, but (as mentioned earlier) it is in the nature of an instruction manual for dealing with a particular situation. That situation does not exist in the "Simple Example" of Section 12. There, the imagined database is fully populated, so missing value handling is not implicated.

Examiner's response:

        ¶ 9. applies. Claims that limit to "soup to nuts" process by which an embodiment

of the invention can produce a decision based on information in a database invite a 35

USC 101 rejection under the concern for preemption (Le Roy v. Tatham, 55 U.S. (14

How.) 156, 175 (1852). Applicant agrees that the prior art of Heckerman does indeed

describe several techniques for addressing missing values and hence, the Examiner's

point is made.

In reference to Applicant's argument:

Furthermore, although claim 11 requires searching through possible relationship models to find a high-scoring network, the example considered in Heckerman's Section 12 does not perform such searching. Instead, Heckerman selects two networks (the one shown in Fig. 3 on p. 13, and the same network with one added arc) and simply asserts that they are the only two that have appreciable probability (see p. 36:1-4). Another example discussed later in Section 12 uses a hand-constructed Bayesian network (see p. 36:16-18), not a high-scoring network found during a search through possible relationship models.

Finally, the Examiner asserts that the claimed operation of preparing a statistical summary of the

processed data in the database is anticipated by Heckerman's Abstract, if one assumes that the claimed "statistical summary" is synonymous with the Abstract's "probabilistic semantics." Applicants believe that there are very few passages in which the words "statistical summary" could be replaced by "probabilistic semantics," and Heckerman's Abstract is certainly not one of them. Heckerman is describing characteristics of graphical models that are Bayesian networks, and asserting that they have the useful property of being able to answer causal questions like "why did this happen?" as well as probabilistic questions like "what are the chances that this will happen again?" These properties may be present in Bayesian networks, and they may be useful, but it is not clear that they have anything to do with the claimed operation of preparing a statistical summary of processed data in the database.

Examiner's response:

¶ 9. applies. Appreciable probability is equivalent to a high-scoring network ...

applicant must remember that "The Examiner has full latitude to interpret each claim in

the broadest reasonable sense." Hence, high-scoring network is synonymous with

appreciable probability. Applicant's argument does not address Heckerman's Table 1

that is a database holding a statistical summary.

In reference to Applicant's argument:

Applicants have no quarrel with Heckerman's descriptions of Bayesian networks, their strengths and weaknesses, or the accuracy of the mathematical derivations presented. However, most of Heckerman merely presents a menu of options and possibilities, leaving the selection and combination thereof to the implementer. In Heckerman's examples that do outline a relatively complete set of choices, the choices are different from Applicants' claimed method. Thus, Applicants respectfully submit that Heckerman does not disclose each element of the rejected claim, arranged as stated in the claim.

Examiner's response:

¶ 9. applies. Applicant has not addressed the specific points of the related Final

Office Action.

In reference to Applicant's argument:

Claim 12 refines the method of claim 11, requiring that continuous variables in the database be discretized before preparing the statistical summaries. This is said to be anticipated by Heckerman at p. 9:11. However, that portion of the reference (generally) is presenting the background mathematics upon which Bayesian networks are founded, and the cited portion specifically notes that "the observed variable X is discrete, having r possible states..." (see Heckerman, p. 9, 1. 11). In addition to being disconnected from any specific sequence of operations, the reference already has discrete data, so there is no need to discretize a continuous variable, as claim 12 recites.

Examiner's response:

¶ 9. applies. Applicant limits to "discretizing continuous variable" which is a

discrete variable such as Heckerman identifies on page 9, line 11.

In reference to Applicant's argument:

Claim 14 refines the method of claim 11, limiting it to circumstances where the new case for which a decision is to be computed consist of values of a subset of fields of a record. Although Heckerman does discuss missing values, unobserved values, and related subjects, the portion relied upon by the Examiner (p. 12, 11. 16-23) discusses challenges that may be encountered in building a Bayesian network and not producing a decision based for a new case with missing values. Applicants' review of other sections that concern missing values does not disclose a connection to any of Heckerman's proposed sequences for computing a decision, so it is respectfully submitted that the rejection of claim 14 is inadequately supported.

Examiner's response:

¶ 9. applies. Heckerman address the need to determine subset of observations

worthwhile to be modeled which would anticipate applicant's "subset of fields of a

record."

In reference to Applicant's argument:

Claim 15 recites a specific application of the method of claim 11, wherein the database records represent bank customer transaction records, and the decision is to identify an at-risk customer of the bank. The Examiner rejects this in view of a passage in Heckerman that discusses identifying fraudulent credit card transactions. Thus, although bank customer transaction records are arguably involved, the decision in each case is different. Heckerman purports to identify (possibly) fraudulent transactions, while the method of claim 15 identifies at-risk customers. A customer is different from a transaction, so the reference fails to teach or suggest every element of the claim.

Examiner's response:

¶ 9. applies. Fraudulent transactions identify someone ... at-risk customers.

In reference to Applicant's argument:

Claim 18 recites a refinement of the method of claim 11, comprising aggregating similar database records and computing a frequency of occurrence. This is rejected in view of a portion of Heckerman that contrasts the Bayesian approach with classical probabilistic analysis of a simple system: throwing a

thumbtack up and determining the probability that it will land on its point or on its head. It is the classical probabilistic analysis in which the results of several throws are combined to produce an estimate of the probability for a subsequent throw. Thus, the "aggregating" arguably disclosed in this portion of the reference is irrelevant to the Bayesian network approach discussed in the example relied upon to reject the base claim of claim 18. In addition to the deficiencies in the rejection of base claim 11, Applicants respectfully submit that the rejection of claim 18 rests on material that cannot be incorporated.

Examiner's response:

¶ 9. applies. Heckerman at page 5, lines 8-21, leads with "To illustrate the

Bayesian approach" …and a database is aggregated with a frequency of occurrence.

In reference to Applicant's argument:

Claim 19 refines the method of claim 18, requiring the use of hashes to cluster the database records. This claim is rejected in view of a brief discussion of variables whose values correspond to the possible true values of the physical probability. Hashes, on the other hand, are pseudo-random numbers that represent a sort of condensation or compression of data. Hashes are often irreversible, but are useful to compare two (possibly large) data objects: if the data objects have the same hash value, then they are (very likely to be) identical.

This property is useful in grouping (or clustering) database records, as recited in the claim, but it is not clear what Heckerman's variables, discussed at p. 5:33 through p6:l, have in common with such hashes.

Examiner's response:

¶ 9. applies. Hashes are not defined in the applicant's specification. In The

Authoritative Dictionary of IEEE Standards Terms, Seventh Edition, hash is hashing

which is defined as "A technique for arranging a set of items, in which a hash function is

applied to the key of each item to determine its has value. The hash function, is the

function used to determine the position of a given item in a set of items. Θ will cluster

the database records as Heckerman's parameter corresponding to the true values of

physical probability and such value will appropriately be placed in the database …

hashing.

In reference to Applicant's argument:

Claim 20 refines the method of claim 11, requiring that the database structure be an alternating decision tree ("ADTree"). The Examiner asserts that an ADTree is a binary tree, and that Heckerman's binary variables achieve the same result. An ADTree may, indeed, be a binary tree, but the converse is not true: not all binary trees are ADTrees. Furthermore, the portion of Heckerman relied upon by the Examiner does not appear to address binary trees. For example, the Bayesian network depicted in Heckerman's Figure 4 is not a binary tree (note that "Sample 1," "Y" has three parent nodes). It is also unclear that the cited text has much to do with either binary trees or binary variables, though perhaps there is a deeper connection that seems implicit to the Examiner but is lost on Applicants.

Examiner's response:

¶ 9. applies. Applicant agrees that an alternating decision tree is a binary tree and that Heckerman has such binary trees. The parent nodes in Fig. 4 each identify a binary structure.

In reference to Applicant's argument:

Claim 23 extends the method of claim 11, requiring the high-scoring network to be stored in an eXtensible Markup Language ("XML"). This claim is rejected in view of Heckerman's mention of a system called BUGS that was developed by Thomas, Spiegelhalter, and Gilks. The Examiner asserts that "BUGS is available in hypertext markup language which for the purpose intended is not functionally distinct from extensible markup language." However, no support for this assertion is offered, and even assuming (arguendo) that the first part is true, it does not follow that HTML is not functionally distinct from XML. XML has many differences from HTML, as those of skill in the relevant arts will be aware, and may be thought of as a superset of HTML. It is significant that the claim recites XML: HTML would not offer adequate functionality for the purposes of an embodiment of the invention.

Examiner's response:

¶ 9. applies. The Examiner has full latitude to interpret each claim in the broadest reasonable sense. However, a superset of HTML is equivalent to a broad interpretation that includes XML concepts. Heckerman assets at page 46, lines 9-10, "...called BUGS that takes a learning problem specified as a Bayesian network and compiles this problem ..."

Examination Considerations

6.   The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light

of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44USPQ2d 1023,

1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in

the claim are not read into the claim. *In re Prater,* 415 F.2d, 1393, 1404-05, 162 USPQ

541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The

Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Examiner will reference prior art using terminology familiar to one of ordinary skill in the

art. Such an approach is broad in concept and can be either explicit or implicit in

meaning.

7.   Examiner's Notes are provided with the cited references to prior art to assist the

applicant to better understand the nature of the prior art, application of such prior art

and, as appropriate, to further indicate other prior art that maybe applied in other office

actions. Such comments are entirely consistent with the intent and spirit of compact

prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior

art but a link to prior art that one of ordinary skill in the art would find inherently

appropriate.

8.   Unless otherwise annotated, Examiner's statements are to be interpreted in

reference to that of one of ordinary skill in the art. Statements made in reference to the

condition of the disclosure constitute, on the face of it, the basis and such would be

obvious to one of ordinary skill in the art, establishing thereby an inherent prima facie statement.

9.   Examiner's Opinion: ¶¶ 6.-8. apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Conclusion

10.   Claims 11-23 are rejected.

Correspondence Information

Any inquiry concerning this information or related to the subject disclosure should be directed to the Primary Examiner, Joseph P. Hirl, whose telephone number is (571) 272-3685. The Examiner can be reached on Monday – Thursday from 5:30 a.m. to 4:00 p.m.

As detailed in MPEP 502.03, communications via Internet e-mail are at the discretion of the applicant. Without a written authorization by applicant recorded in the applicant's file, the USPTO will not respond via e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. A paper copy of such correspondence will be placed in the appropriate patent application. The following is an example authorization which may be used by the applicant:

Notwithstanding the lack of security with Internet Communications, I hereby authorize the USPTO to communicate with me concerning any subject matter related to the instant application by e-mail. I understand that a copy of such communications related to formal submissions will be made of record in the applications file.

If attempts to reach the Examiner by telephone are unsuccessful, the

Examiner's supervisor, David R. Vincent can be reached at (571) 272-3080.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

Hand delivered to:

Receptionist,

Customer Service Window,

Randolph Building,

401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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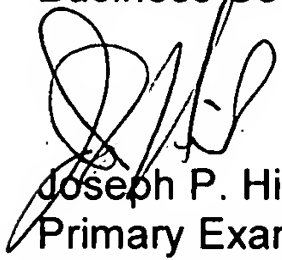
For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have any questions on access to Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll free).

Joseph P. Hirl
Primary Examiner
August 21, 2007